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Placement Assist Bot

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ABSTRACT

Placement cell is very crucial management deals with Placement activities respective to Universities and Colleges. This brings up Placement coordinators, Students to monitor all the activities easy to handle in all one place as a Web Application with (AI) Chatbot facilities. This application has a basic dashboard which stores the information of the student and further used in placement process and activities, Scheduled meetings are notified as well as the placement training activities are handled. The Chatbot which is built on NLP basis where the intent is in the form of json fed to a basic model and trained with the pre-processed corpus and deployed using Flask. This chatbot handles the basic queries related to the placement preparation as per the company specified. Chatbots can engage the users and build a good relationship for more personalised usage/experience.

Keywords: AI, Chatbot, NLP, Intents, Corpus, Pre-Processing, Flask.

1. INTRODUCTION

Chatbots are in simple words an AI based NLP program which can stimulate human conversations, also known as digital assistants to understand capabilities to interpret, analyse and respond to the user queries/requests relevantly.

They can also respond through the voice as well as text as we require to develop and embed in our websites or applications or messaging channels.

The Proposed System is a web application where placement related activities are held at one platform where chatbot is also embedded in it and can solve the user queries regards Placement preparation.

The proposed system mainly deals with two kind of approaches they are: Pattern matching & NLU.

Pattern matching is something where the bot tries to group the text produced to the appropriate response from the user. It

correlates the queries and the responses by which we trained the model after certain pre-processing steps.

NLU is Natural Language Understanding ability of bots to understand human requests by converting text data into structured data for machine understanding, where the entities, tags and context play a major role.

2. PROBLEM IDENTIFICATION

The main problem that we are addressing here is the congestion of handling the placement activities in various platforms for various purposes, The required resources for placement are also shared here at one web application, and to automate some of the processing the chatbot. And to guide the students to choose the right plan of preparation for the top MNC's visiting the campus like Amazon, Apple, Microsoft, etc.

3. RELATED STUDY



The Architecture of the chatbot mentioned in the Reference [] confined to the Google DialogFlow interface commonly used to develop NLP based chatbots which is Build-once and deploy everywhere development suite. Also offers a new analytical tool to help in assessing usage patterns, latency and high intents, as due to GUI people who are also not from technical background can also build AI based chatbot using DialogFlow. In this they have trained the bot by providing multiple intents manually and

giving related responses which, the model will randomly exhibit as a response.

The other related study was on chatbots for education system had an architecture mentioned in the Reference [], Where the input sentence is taken and pre-processing steps like Normalization & Tokenization happens later this processed data is sent for POS tagging i.e., Parts of Speech tags assigned to each word and been parsed for Rule matching. In this step the corpus fed to database is taken consideration and matches the response and applied rule matching algo to find the best match response.



The other Related study was on Recruitment & Placement drive Support System where the main moto is to implement an application for students to understand the recruitment process in colleges and upgrading the idea of surfing the recruitment process. More like an application to send and receive information about the drives taking place in campus. The working of the system is divided as per the role of the user differs from Student, TnP Campus, and the admin, different modules are introduced to solve with the related data required to be accessed from the database directly and present it to the user. The upgrade or the catch we took from this related paper was to automate the process and to build a pro-active chatbot and to improve the efficiency of the bot.

4. MODULES IN PROPOSED SYSTEM

The Proposed system is a web application composed with mainly four modules to make it ease to handle every task related to the placement.

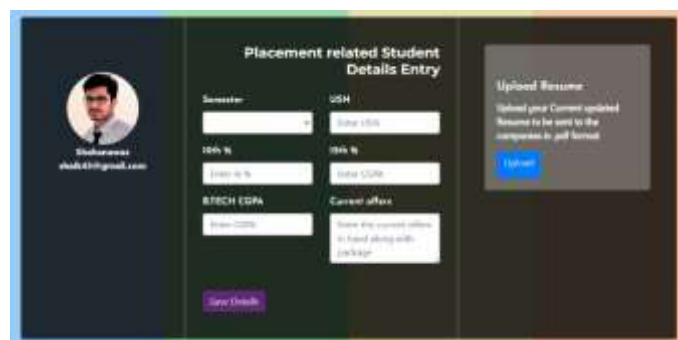
- **Placement Calendar & Events:** This module takes care of the individuals calendar regards the placements happening like to record the events he/she should be part of & also to make a note of Interviews or any Coding tests that are part of recruitment process in the particular enrolled company. This module uses JavaScript to store the events that are added by the user in the database and to create an alert.



- **Training Activities:** This module is responsible for the training activities to be held at one place and provides the required "Alumni Experience" and also the required study material for to prepare for placements in the spot of soft skills as well.



- **Personal Dashboard:** This module has a personalised view of your data required for placement and makes it easier to send an application to the company for the job role just in a click without entering your data again and again.



- **Assist Bot:** This is a dedicated module where the chatbot is deployed as a webpage which takes user requests as text format and responds back with the matched and relevant response from the intent file provided.



5. METHODOLOGY

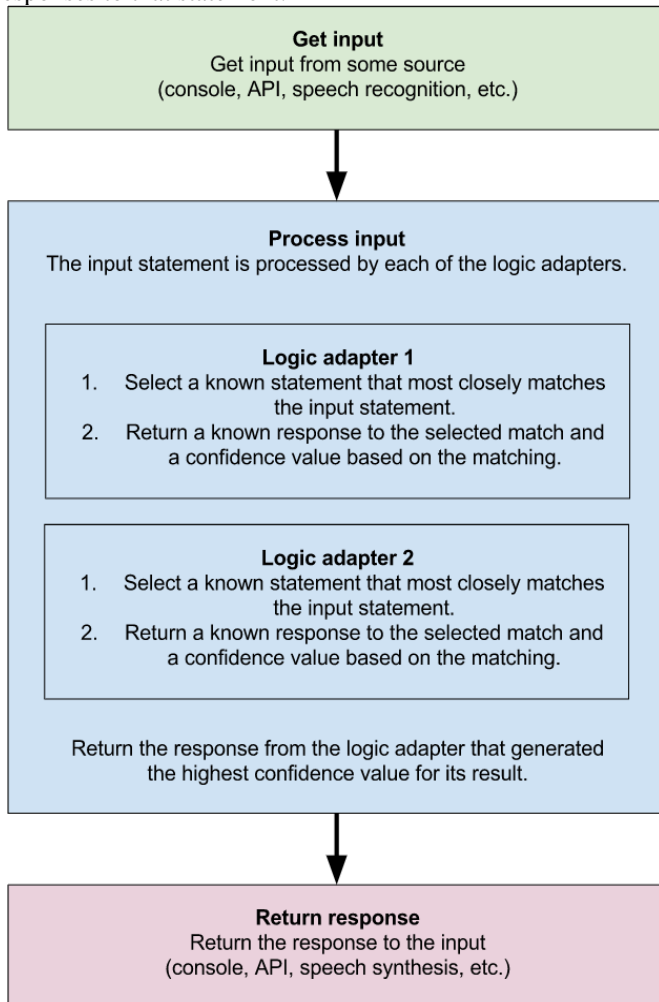
Basically, in the process of building a chatbot we have implemented both the Chatterbot library as well as the user defined Chatbot to analyse and contrast the differences.

Using Chatterbot Library:

ChatterBot is a Python library which makes easy to develop a software to engage in digital conversations

An untrained example of ChatterBot starts off and not using a expertise of how to speak. every time a person enters a announcement, the library saves the textual content that they entered and the text that the statement become in response to. As ChatterBot getsextra enter the quantity of responses that it is able torespond and the accuracy of every response on the subject of the enter assertion boom.

The program selects the closest matching response by using looking for the nearest matching known announcement that fits the enter, it then chooses a reaction from the selection of known responses to that statement.



Process flow of Chatterbot

We have deployed it using Flask a lighter frameworkto deploy web applications. We have trained the chatterbot with manual corpus in .yml format which consists of the preparation guides as well as required information for the Interview preparation of that respective company.

Using User Defined Chatbot:

Before providing the model with the data that is intent file in our case, it should be undergone some preprocessing steps which define the chatbot performance. For which we used nltk module and with the help of punkt and wordnet packages as reference

Wordnet is lexical database used for English language, which

helps with understanding of the words present in the corpus like with the meanings, antonyms, synonyms and more.

Punkt is used for tokenizing the text and make a list of sentences using unsupervised learning algo for building abbreviations collection and words for start sentence

The corpus then has undergone tokenizing and lemmatized after ignoring the words which end with ‘?’ . ‘!’ . Now the training data is prepared with the pattern words that to be matched within the corpus, and the words with its respective classes are stored using pickle.

This preprocessed corpus is now fed to the model of structure mentioned below in 2a) for which we have used SGD as an optimizer.

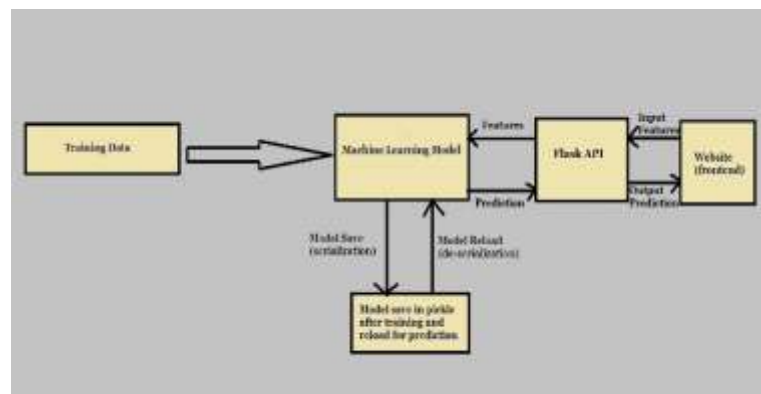
Model: "sequential_5"

Layer (type)	Output Shape	Param #
dense_8 (Dense)	(None, 128)	2432
dropout_7 (Dropout)	(None, 128)	0
dense_9 (Dense)	(None, 64)	8256
dropout_8 (Dropout)	(None, 64)	0
dense_10 (Dense)	(None, 4)	260
Total params: 10,948		
Trainable params: 10,948		
Non-trainable params: 0		

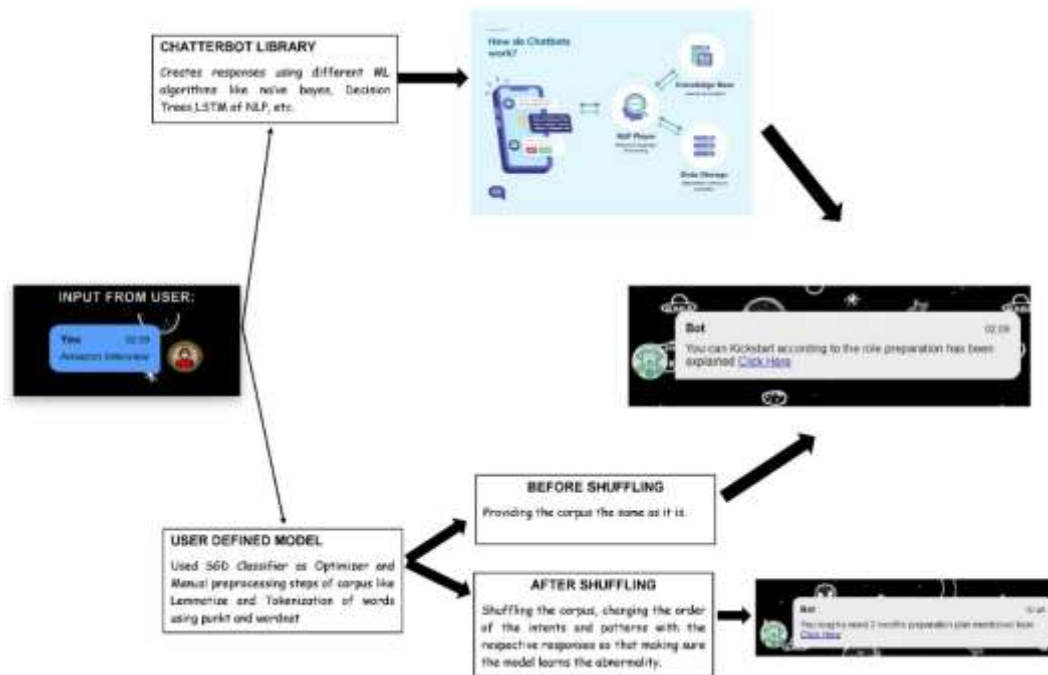
2a) Model Architecture

- After the model has been successfully trained with the corpus, we save the model weights and its structure with h5 extension to be further used in processing the response of the user query
- In the processing of user query we clean up the sentence received and predict the response from the intent file after applying BOW (Bag Of Words) model to the query asked. And generate a respective response randomly from the intent matching its tag and pattern.
- This is further deployed as a web application using Flask and the architecture followed is mentioned below in 2b.

2b) Flowchart of Application



6. RESULTS & CONCLUSION



Flowchart of the responses for both Built-in and User Defined Model

As pictured in the above flowchart we are trying to draft that how training the corpus and the responses of Built-in and User Defined models differ the process mentioned of the both ways are as mentioned in methodology. Here the importance of shuffling the corpus before training also matters in the responses. Shuffling/Normalization of data leads to minimizing the training loss as well as reduce variance and keenly observes the model to not overfit in sensitive cases.

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